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APPLICATION OF ELASTIC RECOIL DETECTION ANALYSIS FOR MATERIALS USED IN THE YUCCA MOUNTAIN WASTE REPOSITORY

Elias Sideras-Haddad, Marc W. Caffee, Mark L. Roberts, Graham S. Bench, Annemarie Meike, and William L. Bourcier, Lawrence Livermore National Laboratory, Livermore, CA.

The Elastic Recoil Detection Analysis (ERDA) method is being used at the Multi-user tandem Laboratory at LLNL to determine the hydrogen content in materials under consideration for nuclear waste repositories. Examples are glasses used for containment of waste and inhomogeneous materials, such as concrete, to determine hydrogen reaction rates. ERDA has been calibrated on our system using a hydrogen implanted silicon wafer. The technique is being applied in a recently-developed micro-scanning mode using a high energy, high charge state Cl-35 heavy ion beam. In this way three dimensional profiles of hydrogen content can be obtained. ERDA has a depth resolution of the order of 50 nm and a lateral spatial resolution of the order of 10 μm. The advantage of ERDA is that inhomogenieties can be spatially resolved.

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Contact Author:
Marc. W. Caffee
Lawrence Livermore Nat'l Lab
Earth Sciences Dept.
P.O. Box 5514, L-206
Livermore CA 94551 USA
Phone: (510) 423-8395